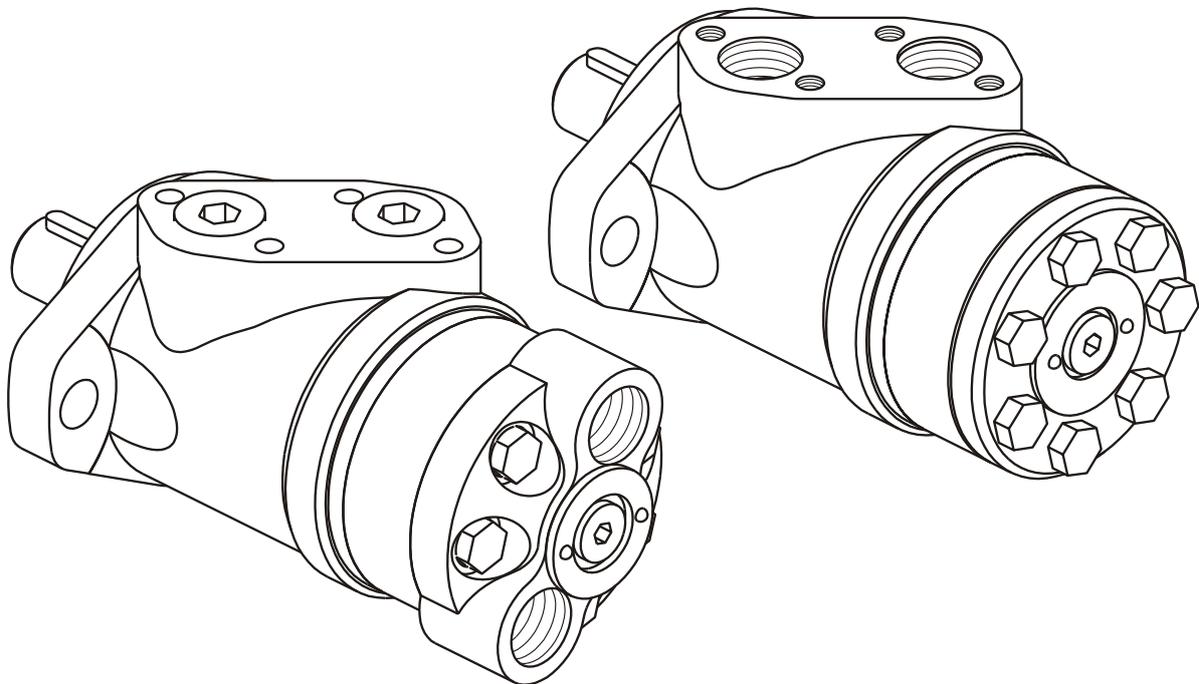
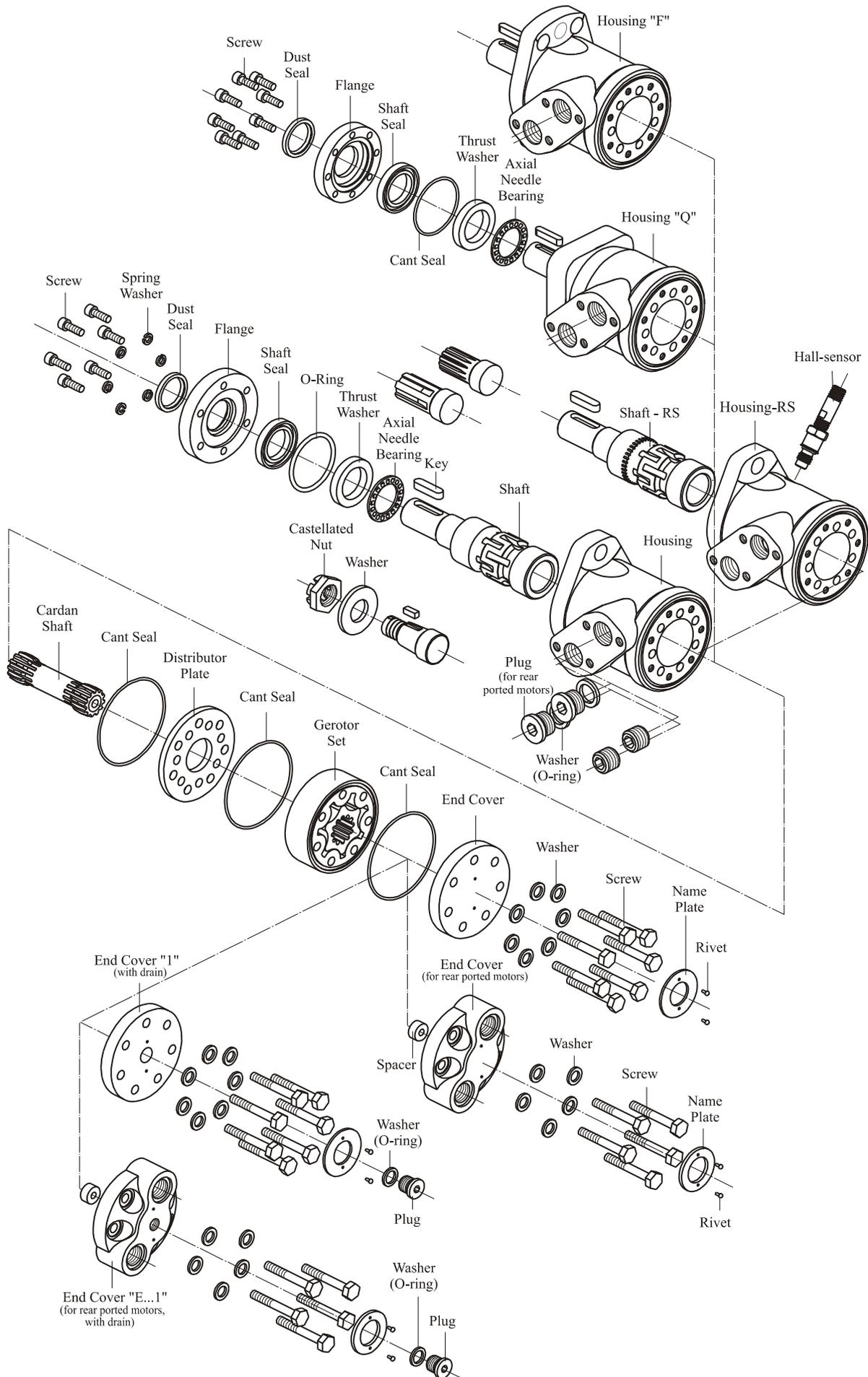


# SERVICE MANUAL

*Hydraulic Motors type MP- series 4*  
*and MLHP...E*



2008



Instructions in this manual are for MP-series 4 and MLHP...E motors.

Cleanliness is extremely important when repairing these motors. Work in clean area!

Before disassembly, drain oil from motor.

Remove castellated nut, washer and key when used. For motors with drain unscrew drain plug and remove washer (O-ring).

Although not all drawings show the motor in disassembly devise (vise), we recommend that you keep motor clamped during disassembly.

1. For rear ported motors only! Unscrew the plugs using S10 Allen head spanner and remove the washers.

2. Place the motor in disassembly devise with output shaft down.

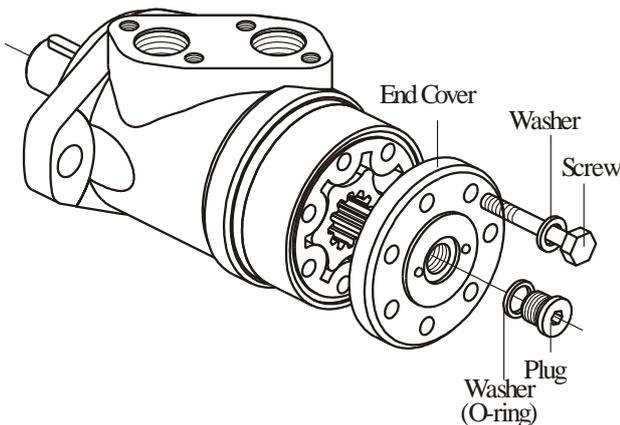


Fig.1

3. Unscrew screws using S13 torque wrench. Remove washers (see Figure 1).

4. Remove end cover.

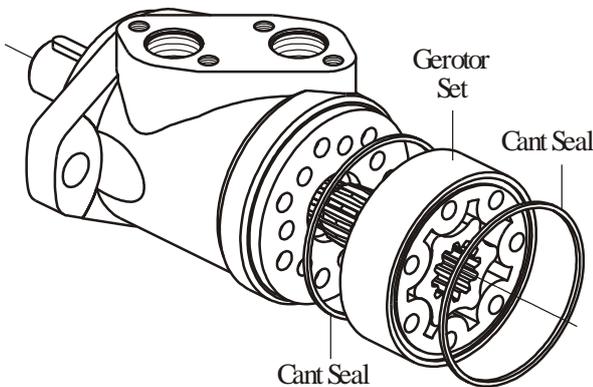


Fig.2

5. Remove the gerotor set carefully to prevent dropping of rotor from stator. Do not dismount!

Remove Cant seals from gerotor set grooves (see Figure 2).

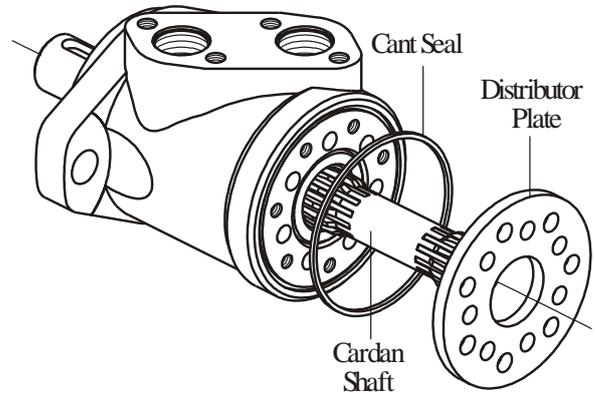


Fig.3

6. Remove cardan shaft (see Figure 3).

7. Remove distributor plate.

8. Remove Cant seal from housing.

Reposition motor in disassembly devise with shaft upward.

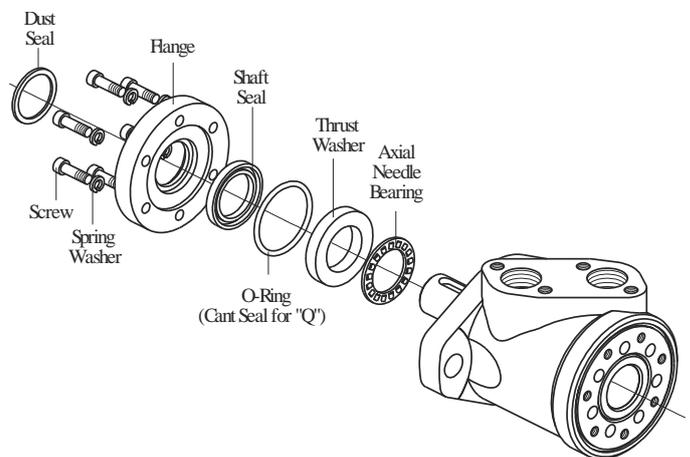


Fig.4

9. Unscrew screws using S6(5) Allen wrench (see Figure 4)

For "Q"-flange only: The screws (8 psc.) are assembled with Loctite to hold them in place. A higher torque is required to break screws loose.

10. Remove flange from housing. Dust seal and Shaft seal will come out with flange.

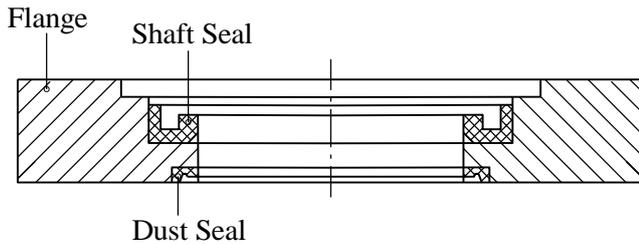


Fig.5

11. Remove with small screwdriver Dust seal and Shaft seal from flange (see Figure 5). Work from outer side for both seals.

Note: Some motors may have Quad-ring in place of the Shaft seal.

12. Remove shaft from housing.

13. Remove thrust washer and needle bearing from shaft (see Fig.6).

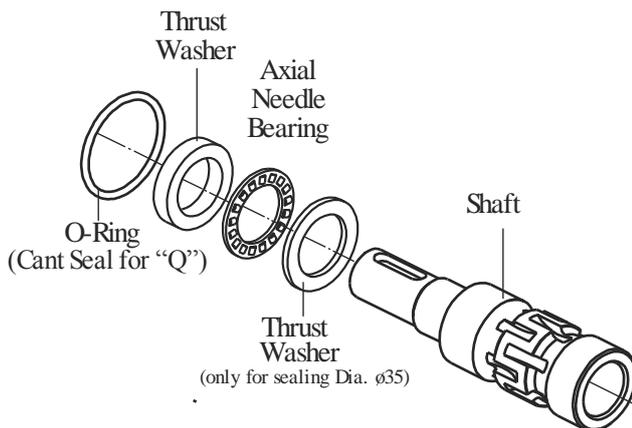


Fig.6

14. Remove O-ring from outer diameter of thrust washer.

Note: If not necessary do not dismount check valves!

### 1. CLEANING:

Wash all parts (except seals) in a weak solvent on carbon base and then degrease.

### 2. MEASURING AND REPLACEMENT:

Measure all parts and compare actual dimensions with the nominal ones given in the technical documentation. Replace any parts with scratches or burrs that could cause leakage or damage with new ones. Use new seals when reassembling motor.

### 3. LUBRICATION:

Lubricate all seal parts, which should be reassembled with light film of petroleum jelly.

### Seal Kits:

SK41 5127 0487 for MP(F)...-series 4  
 SK41 5127 0667 for MPQ...-series 4  
 SK41 5127 0001 for MP(F)...D-series 4;  
 and MP(F)...N...D-series 3  
 SK41 5127 0109 for MPQ...D-series 4;  
 and MPQ...N...D-series 3  
 SK41 5127 0010 for MP(F)...U-series 4  
 SK41 5127 0118 for MPQ...U-series 4  
 SK41 5138 6050 for MP(F)...B-series 3

SK41 5122 2273 for MLHP(F)...E;  
 and MLHP(F)...N...D  
 SK41 5128 0009 for MLHP(F)...UE  
 SK41 5131 8100 for MLHP(F)...D (ø35 sealing dia.)  
 SK41 5122 2417 for MLHPQ(M)...E  
 and MLHPQ(M)...N...D  
 SK41 5128 0441 for MLHPQ(M)...UE

1. Lubricate output shaft with hydraulic oil.

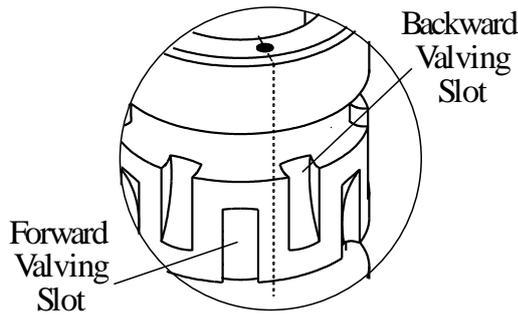


Fig.7

2. On the bottom of the shaft mark a Timing dot placed between forward and backward valving slots as shown on Figure 7.

3. Lubricate lightly all internal housing surfaces with hydraulic oil. Mount shaft in housing.

4. Place the motor in reassembly device with output shaft up.

5. Install needle bearing, then thrust washer on the shaft (see Fig.6).

6. Place lubricated O-ring 48x2 round thrust washer (Cant seal 47,35x1,68x1,68 for "Q"-flange).

Place flange on clean soft surface. Lubricate shaft seal and dust seal with light film of clean petroleum jelly (Shell Retinax Grease HDX2).

7. Place shaft seal in Flange and firmly push with Seal driver (see Fig.8).

8. Install dust seal in flange. Carefully press dust seal into place.

Lips of shaft seal and dust seal must face outward.

**Important:** Check seal condition after installing in housing. If damaged, cut or improperly installed, replace with new ones.

9. Install the spigot flange incl. assembled seals on shaft. Prevent the seals and shaft against damages.

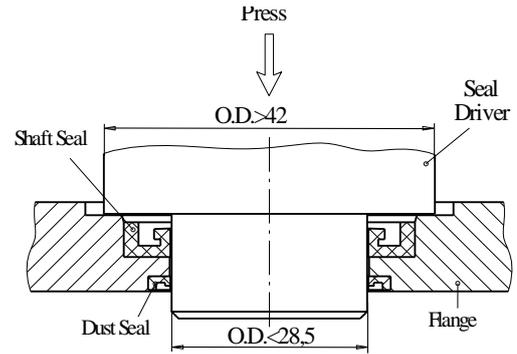


Fig.8

9. Install the spigot flange incl. assembled seals on shaft. Prevent the seals and shaft against damages.

10. Install in the flange 6 screws with washers and alternately torque them to 6÷8 Nm (10÷12 Nm for "U" versions).

For MPQ and MLHPQ(M) only: Before mounting the screws (8 pcs.) apply 2 or 3 drops of **LOCTITE 638** at top of thread of each of holes in housing.

11. Reposition motor in reassembly device with shaft down.

12. Lubricate and install cant seal in housing seal groove (see Fig.3).

**Timing Procedure**

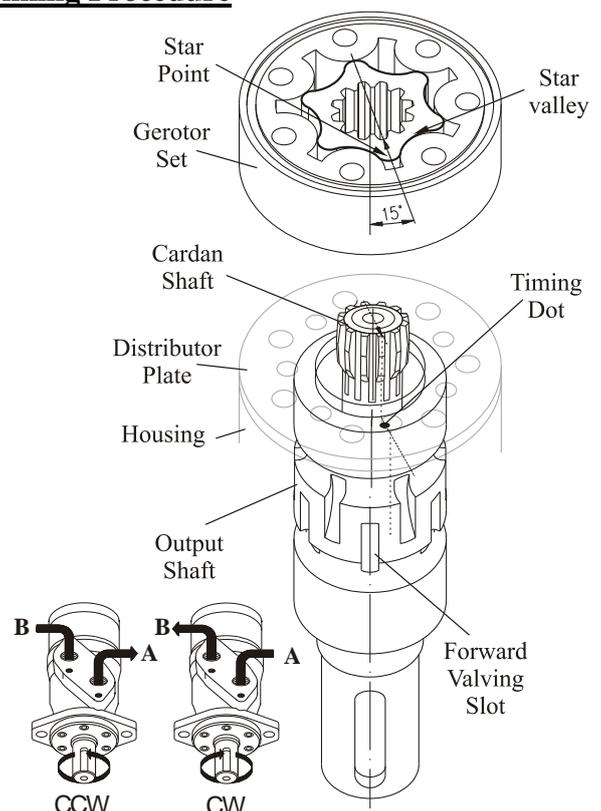


Fig.9

13. Install cardan shaft into splines of output shaft.

14. Use marker to mark one cardan shaft tooth. Align this tooth with shaft timing dot.

15. Install distributor plate on housing.

16. Lubricate cant seals (2 pcs.) and place them in seal grooves of both stator sides.

17. Place gerotor set on distributor plate and align any star point with marked tooth on cardan shaft. Stepped bolt holes are facing with smallest diameter to the distributor plate (see Fig.9)

#### Reverse Rotation:

Reverse rotation is obtained by aligning any star valley with marked tooth on cardan shaft (see Fig 9).

18. Rotate gerotor set to line up with bolt holes.

19. Carefully place end cover on gerotor set.

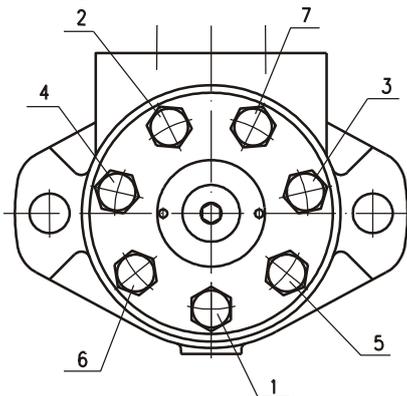


Fig.10

20. Install screws and washers in end cover. Tighten screws with  $3 \div 3,5$  daNm torque ( $4 \div 4,5$  daNm for "U" versions) using a S13 torque wrench in sequence as shown in Fig.10.

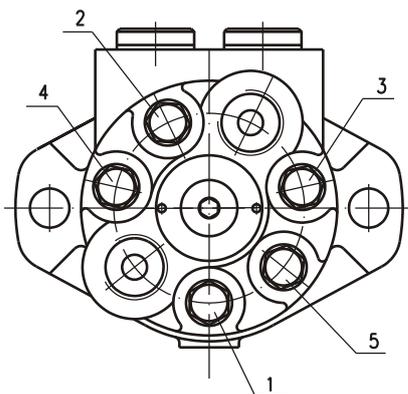


Fig.10A

21. For rear ported motors only: Install washer (O-ring for MLHP...7,8) on plug. Tighten plug with S10 Allen wrench with torque  $3,0 \div 3,5$  daNm. Make sure that End cover is orientated as shown on Figure 10A!

22. Install washer (O-ring for MLHP...4,5,7,8) on drain plug. Tighten plug with S6 Allen wrench with torque  $2,0 \div 2,5$  daNm

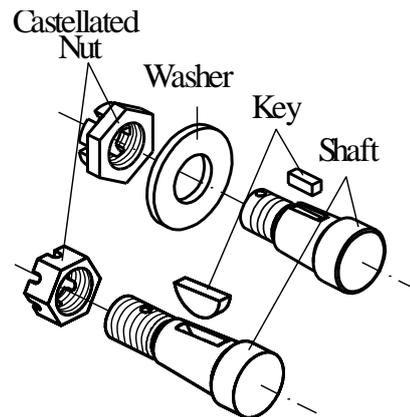


Fig.11

23. Install key in shaft key groove. For cone shafts install washer and screw castellated nut. (see Fig.11).

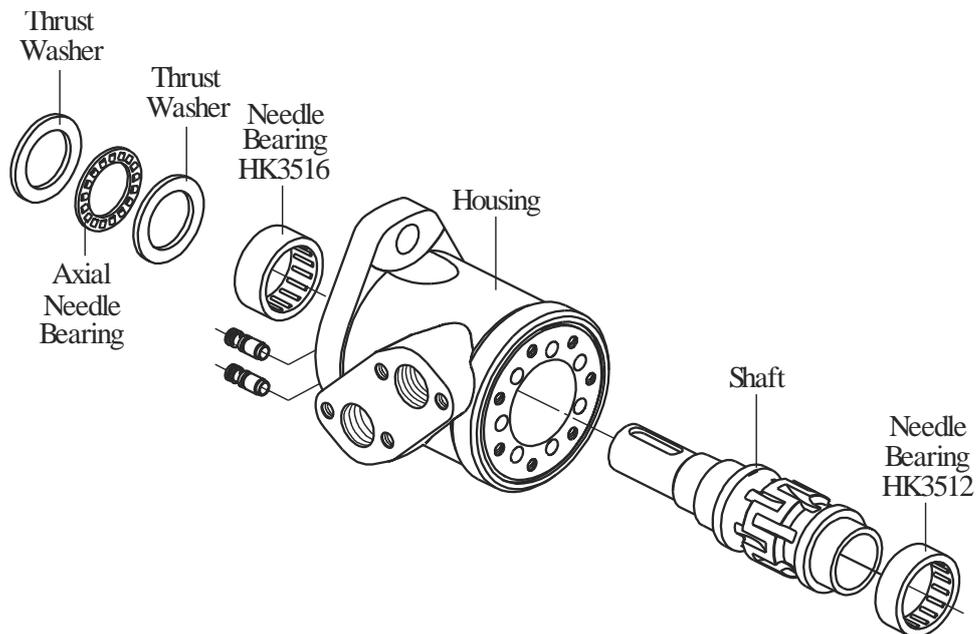
**Disassembly and reassembly of MP (MLHP)...N... (with Needle Bearings):**

Fig.12

These motors are the same as the standard motors, but have 2 needle bearings. Follow the same disassembly and reassemble procedures as for the standard motor.

Needle bearing HK3516 will come out with Shaft. Knock Needle bearing HK3512 out of housing with plastic hammer and soft bushing.

Assemble the Needle bearing HK3516 in the Housing at a depth of  $9,4 \pm 0,15$  mm from the spigot flange joint. Grease the shaft journals and assemble in the housing. Assemble the Needle bearing HK3512 in the Housing at max. depth of 0,1 mm.

Clearance must be: - between shaft and bearings-  $0,010 \pm 0,003$  mm;

- between bearings and motor housing at diameter  $\varnothing 42$ -  $0,017 \pm 0,003$  mm

**Note:** If it is not necessary, do not disassemble shaft and needle bearings from the motor housing,.

**Disassembly and reassemble of MP(MLHP)W...**

These motors are the same as the standard motors except setting screw torqued in housing (see Fig.13). Follow the same disassembly and reassemble procedures as for the standard motor.

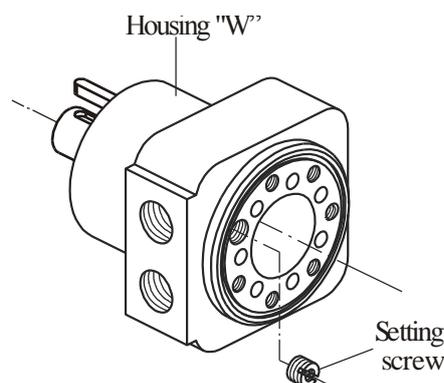


Fig.13